

RP0807 - PERFORM SPLINTING TECHNIQUES

TERMINAL LEARNING OBJECTIVE.

1. Without the aid of references, given a casualty and standard combat lifesaver medical equipment set, perform splinting techniques, Per the Pre-Hospital Trauma Life Support Manual per PHTLS: military version, 6th ed. (RP00.08.07)

ENABLING LEARNING OBJECTIVES.

1. Without the aid of references, given a casualty and standard combat lifesaver medical equipment set, apply splints, Per the Pre-Hospital Trauma Life Support Manual per PHTLS: military version, 6th ed. (RP00.08.07a)
2. Without the aid of references, given a casualty and standard combat lifesaver medical equipment set, apply bandages, Per the Pre-Hospital Trauma Life Support Manual per PHTLS: military version, 6th ed. (RP00.08.07b)
3. Without the aid of references, given a casualty and standard combat lifesaver medical equipment set, apply the general rules of splinting, Per the Pre-Hospital Trauma Life Support Manual per PHTLS: military version, 6th ed. (RP00.08.07c)

1. **GENERAL.** A fracture is any break in the continuity of a bone. Fractures can cause total disability and in some cases death by severing vital organs and/or arteries. Complete recovery depends greatly upon the first aid the casualty receives before being moved

2. BASIC ANATOMY OF THE MUSCULOSKELETAL SYSTEM.

a. **Axial Skeleton** - The axial skeleton consists of the skull, spinal column and rib cage

b. **Appendicular Skeleton** - The appendicular skeleton consists of the bones of the upper extremities which include the scapula, bones of the lower extremities, and the pelvic girdle

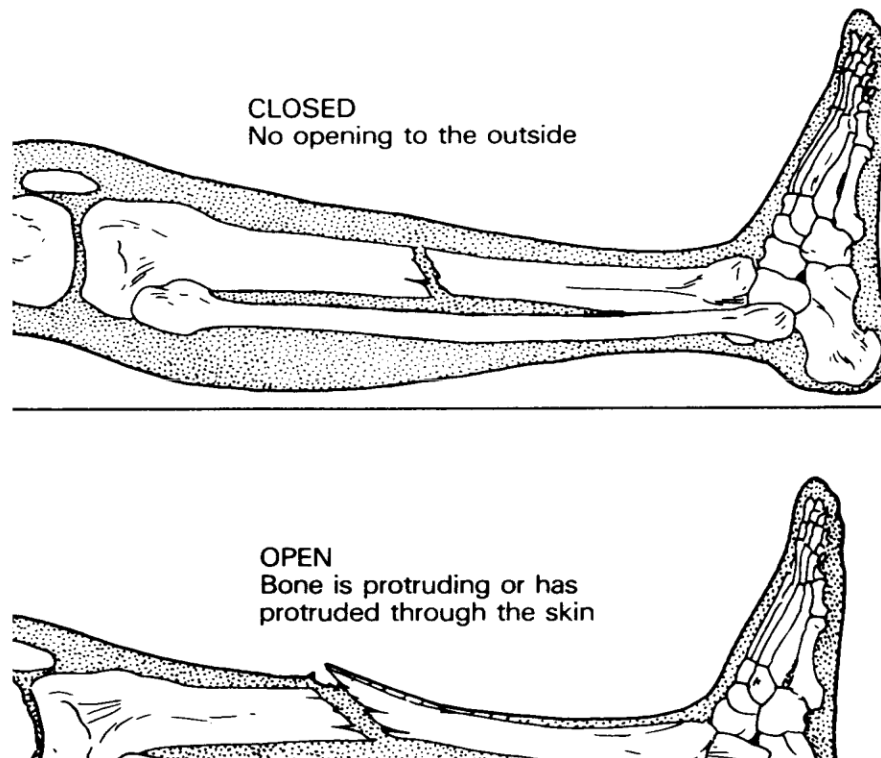
(1) The upper extremities are made up of the humerus, ulna, radius and bones of the wrist & hand

(2) The lower extremities are made up of the femur, tibia, fibula, patella and bones that make up the ankles & feet

3. **TYPES OF FRACTURES** - Fractures will be classified as either open or closed and further classified according to position, number & shape of bone fragments

a. **Open Fracture** - A broken bone that breaks the overlying skin. The bone may protrude through the skin or a penetrating object such as a bullet or shell fragment may go through the flesh and break the bone. (See Figure 1)

b. **Closed Fracture** - A broken bone with no skin penetration. The tissue beneath the skin may be damaged. (See Figure 1)



b.

Figure 1; Open/Closed fractures

4. **TYPES OF SPLINTS** - Splints are used to immobilize a portion of the body that is injured, prevent further damage, and to alleviate pain

a. **Rigid Splints**- Rigid splints cannot be changed in shape. The injured body part must be positioned to fit the splint. Examples include board splints,(wood, plastic, or metal) and inflatable “air splints”

b. **Formable Splints**- Formable splints can be molded into various shapes and combinations to accommodate the shape of the injured extremity. Examples include vacuum splints, pillows, blankets, cardboard splints, SAM splints and wire ladder splints. (See Figure 3)

c. **Improvised Splints** - Improvised splints are made from any available material that can be used to stabilize a fracture. Examples include sticks, branches, and tent poles

d. **Anatomical Splints** - Use of the casualty’s body as a splint. Examples include securing the legs together, securing the arm to the body, and taping the fingers together (See Figure 4)



splint

Figure 3; Formable



Bandage

Figure 4; Anatomical splint & bandage

5. **TYPES OF BANDAGES** - A piece of gauze either commercially manufactured or improvised. It can be used to wrap or bind a body part. Bandages hold splints in place, apply additional pressure, & protect the casualty from further harm

- a. **Kerlex** - (See Figure 5)
- b. **Ace Wrap** - (See Figure 6)
- c. **Cravats or Triangular Bandages** - (See Figure 7)
- d. **Casualties Clothing** - (socks, belt, shirt)





Figure 6; Ace wrap



Figure 7; Cravat

- e. **Sling** - a bandage suspended from the neck to support an upper extremity. When using a sling, position the hand higher than the elbow and never cover the fingers
- f. **Swath** - Any band or piece of cloth used to further immobilize a fracture

6. SPLINTING FRACTURES.

a. **General Rules for Splinting** - Regardless of the type of splint you are using, certain guidelines must be followed

- Establish distal pulse prior to splinting.
- Expose fracture site
- Control hemorrhage
- Splint fracture in position found
- Attempt to straighten a deformed limb only if it is a closed injury with no distal pulses
- Do not try to reposition or put back an exposed bone
- Move the fractured part as little as possible while applying the splint
- Pad the splint at any bony prominence points (i.e. elbow, wrist or ankle)
- Immobilize the splint above and below the fracture
- Reassess distal pulses after splint is secured
- When in doubt, treat all injuries as a possible fracture

b. Signs and Symptoms of Fractures

- (1) Deformity
- (2) Swelling
- (3) Pain
- (4) Inability to move the extremity/sharp pain with movement
- (5) Protruding bone
- (6) Crepitus (crunching, grating sound/feeling)
- (7) Any injury that may indicate fracture (gun shot wound)

7. Splinting Fractures - Splint all fractures in position found unless no distal pulse is present. The type of splint used will depend on the fracture

a. Fractured Clavicle

- (1) Control hemorrhage
- (2) Sling & swath
- (3) Treat for shock
- (4) Evacuate casualty

b. Fractured Humerus

- (1) Control hemorrhage
- (2) Check distal pulse
- (3) Splint the injury to the body using a full arm wrap leaving the elbow exposed (Kerlex or ace wrap)
- (4) Re-check distal pulse
- (5) Treat for shock
- (6) Evacuate casualty

c. Fractured Radius/Ulna

- (1) Control hemorrhage
- (2) Check distal pulse
- (3) Splint from wrist to elbow (rigid or formable splint)
- (4) Re-check distal pulse
- (5) Place casualties hand in top of blouse/jacket for elevation and support
- (6) Use a cravat to cradle elbow & tie around body for immobilization
- (7) Treat for shock
- (8) Evacuate casualty

d. Fractured Wrist/Hand

- (1) Control hemorrhage
- (2) Check radial pulse
- (3) Splint in position of function leaving fingers exposed (formable splint)
- (4) Re-check radial pulse
- (5) Place casualties hand inside blouse/jacket for elevation
- (6) Treat for shock
- (7) Evacuate casualty

e. Fractured Ribs

- (1) Assess ABCs for possible complications
- (2) Bandage arm to injured side of chest to reduce motion and pain
- (3) **NEVER** encircle the chest with any type of constricting bandage, this will only make breathing more difficult!
- (4) Treat for shock
- (5) Evacuate casualty

f. Fractured Pelvis

- (1) Control hemorrhage
- (2) Check distal pulse
- (3) Wrap sheet snugly around pelvis for support
- (4) Tie knees and ankles together for greater stability
- (5) Re-check distal pulse
- (6) Treat for shock
- (7) Evacuate casualty

g. Fractured Femur

- (1) Control hemorrhage
- (2) Check distal pulse
- (3) Using four (4) cravats to secure injured leg to the uninjured leg (buddy splint)
 - (a) Secure thighs together
 - (b) Secure another cravat directly above the knees
 - (c) Secure calves together
 - (d) Using a figure 8 wrap, secure ankles & feet together
- (4) Re-check distal pulse
- (5) Treat for shock
- (6) Evacuate casualty

h. Fractured Patella

- (1) Hemorrhage control
- (2) Check distal pulse
- (3) Splint in position of comfort
- (4) Re-check distal pulse
- (5) Treat for shock
- (6) Evacuate casualty

i. Fractured Tibia/Fibula

- (1) Hemorrhage control
- (2) Check distal pulses
- (3) Splint from knee to ankle (formable or rigid splint)
- (4) Re-check distal pulse
- (5) Treat for shock
- (6) Evacuate casualty

j. Fractured Ankle/Foot

- (1) Control hemorrhage
- (2) Check pedal pulse
- (3) Splint injury
 - (a) Wearingboot: use cravat to secure ankles together
 - (b) Withoutboots: using a figure 8 wrap, secure ankles and feet together
- (4) Re-check pedal pulse

- (5) Treat for shock
- (6) Evacuate casualty

k. **Spinal Injury** - Due to the low probability of a spinal injury occurring in combat with penetrating trauma, the primary concern is to first remove the casualty from the firefight. Once the casualty has been moved to a safer location, the CLS can initiate spinal immobilization procedures.

- (1) Indications for spinal immobilization:
 - (a) High speed vehicle crash (>30mph)
 - (b) Falls from great heights (2-3x body height)
 - (c) Direct, blunt neck trauma
 - (d) Blast injury
- (2) To be effective, the casualty must be immobilized from the head to the pelvis
- (3) Do Not block the casualties airway
- (4) Use a C-collar to immobilize the neck
- (5) If available, secure casualty to a long spine board
- (6) If full body immobilization is not possible, prevent excessive, unnecessary movement of the casualty

NOTE: Not all casualties will require treatment of shock and/or evacuation. The CLS must assess each casualty individually to determine what actions should be taken

REFERENCES: Pre-Hospital Trauma Life Support Manual Chapter 10; First Aid, FM 21-11 Chapter 4